

Summer 2017

Department of Physics Newsletter



WESTERN MICHIGAN
UNIVERSITY



Message from Dr. Kirk Korista, Department Chair

Welcome to another edition of our newsletter. Over this past academic year, the department hosted two events that brought hundreds of middle and high school students to campus. The students took part in tours of the 6 MV Tandem Van de Graaff particle accelerator, and in building wind power devices and solving fun problems. We were reacquainted with one of our alumna who was honored with the 2016 Alumni Achievement Award, Physics. Our alumni are doing wonderful things, which you can read about throughout this newsletter. I'm also delighted to highlight some of the research successes of our excellent faculty, including just over one million dollars in new and renewed grants. We also bid farewell to Dr. Kamber as he retires from the department. We hope you enjoy this edition of our department newsletter.



The Department of Physics was thrilled to welcome about 200 eighth graders from Portage Northern Middle School on November 21, 2016. The students got to experience the best of Western's STEM-based programs during a field trip on campus. (Image left: students with College of Arts and Sciences dean, Dr. Carla Koretsky, in front of the Tandem Van de Graaff Accelerator.)



Science Olympiad draws 400 hundred students to WMU

On Saturday, February 25, 2017, over 400 middle and high school students competed in the Region 10 Science Olympiad at WMU. Many faculty, staff, and students from our department volunteered their time to help with this event. Students blew away the volunteers while demonstrating their skills and knowledge in the Wind Power event. They enlightened with tests and demonstrations in Optics. Several star students showed up for Astronomy. Many teams geared up to show off their Rube Goldberg machines in Mission Possible. Special thanks to the WMU Physics Club for volunteering for this event.

2016 Alumni Achievement Award, Physics



The WMU College of Arts and Sciences recognized **Joan de Vries Kelley** (M.A. 1970) with its 2016 Alumni Achievement Award in Physics. Kelley taught science, physics and mathematics for 4 years before beginning a long career working at IBM. As a system programmer, she worked on accounting, performance and recovery components of the operating system. In 1990, she joined the team that created Parallel Sysplex, a cluster of up to 32 IBM mainframes acting together as a single system image to share workloads for high performance and high availability. Computing skills learned in physics research enabled her to design tests, create measurement tools, identify and resolve problems and publish performance results for this product. She made a number of presentations at technical conferences, both domestically and internationally. For her efforts, she was promoted to Senior Technical Staff Member, the first woman to receive that honor in the performance organization, and was awarded a Corporate Award, the highest level of award given by IBM.



Department of Physics Award Ceremony

On April 20, 2017, our department honored undergraduate and graduate students during our annual awards ceremony. Students were selected based on their outstanding work during the 2016-17 academic year. The winners are listed below. Our department is proud to have so many dedicated students.

GRADUATE AWARDS/SCHOLARSHIPS

George and Jean Bradley Graduate Physics Scholarship – **Herlik Wibowo**

George E. Bradley Award – **Jagjit Kaur**

Leo R. Parpart Physics Scholarship – **Prashanta Niraula**

Haym Kruglak Graduate Student Teaching Excellence Award – **David LaMantia, Dev Sadaula, Madhushani Wickramarathna**

UNDERGRADUATE AWARDS/SCHOLARSHIPS

Presidential Scholar – **Spencer Henning**

Charles J. Wilcox Memorial Award – **Spencer Henning**

Thomas Dickinson Award – **Cristien Arzate, Jacob Burke, Andrew Messecar, Katelyn Waters**

Nathan L. Nichols Physics Scholarship – **Cristien Arzate, Jacob Burke, Justin Swaim, Katelyn Waters**

Paul Rood Physics Scholarship – **Andrew Messecar**

PHYSICS COURSE AWARDS

PHYS 1000 – **Chandler Miller**

PHYS 1040 – **Maria Paterno**

PHYS 1130 – **Annie Lilac, Cameron Simon, Matthew Kornas**

PHYS 1150 – **Stephanie George, Annie Lilac**

PHYS 2050 – **Adam Dubs, Karen Ophoff, Suki Singh, Oliver Joy, Alec Kwapis, Allison Lemons, Marwa Ahmed Saad**

PHYS 2070 – **Gabriel Allen, Kyle Erickson, Paige Race, Adam Dubs**

PHYS 3090 – **Joshua White, Quentin Piaskowski**

PHYS 3300 – **Spencer Henning** PHYS 3420 – **Spencer Henning** PHYS 4200 – **Jacob Burke**

PHYS 4220 – **Keith Meyers** PHYS 4600 – **Joshua White** PHYS 4660 – **Otho Ulrich**



Spencer J. Henning is the Presidential Scholar in Physics

Spencer just graduated from Western Michigan University with a major in physics and minors in astronomy and mathematics. He was a member of WMU's Lee Honors College and a Medallion Scholar. Henning conducted research in WMU's particle accelerator laboratory and worked on astrophysics data analysis with faculty members Dr. Famiano and Dr. Korista. As you can see above, Henning has been honored with many awards and scholarships during his time in our department. We wish him well as he embarks on his next journey.

Our alumni are invited to submit updates via our website. Here are a few recent updates:

Christopher W. Van Meter, B.S. in Physics (2002): He is a manufacturing and physics teacher for Ceres High School in California, the only 2016 California Distinguished Partnership Academy in Manufacturing. The Ceres Manufacturing Production and Green Technology (MPGT) Academy is the leader for manufacturing-centric curriculum and renewable energy education. Christopher is currently completing an M.S. in Electrical Engineering from California State University, Sacramento.

Osama Abu-Haija, Ph.D. in Physics (2005): Osama is currently employed in the Applied Physics Department at Tafila Technical University in Jordan as an Associate Professor of Physics.

We love to hear from our alumni. Visit our website, via the link below, to submit your update for inclusion in an upcoming newsletter.

<https://www.wmich.edu/physics/alumni-feedback>

If you've had the chance to visit the second floor of Rood Hall, you've likely encountered our *Faces of Physics* posters. We take great pride in sharing the accomplishments of our graduates. Below you'll find the poster for Dr. David Hoogerheide. He left WMU with a B.S. in Physics, and was accepted into Harvard for his graduate studies. We do our best to prepare our students for success after graduation and we hope you'll take some time to read about all our graduates have accomplished with their degrees from WMU the next time you visit campus. Insider tip: Many of our graduates are featured on our website.

<https://www.wmich.edu/physics/alumni>
<https://www.wmich.edu/physics/careers>

Faces of Physics



**David
Hoogerheide**

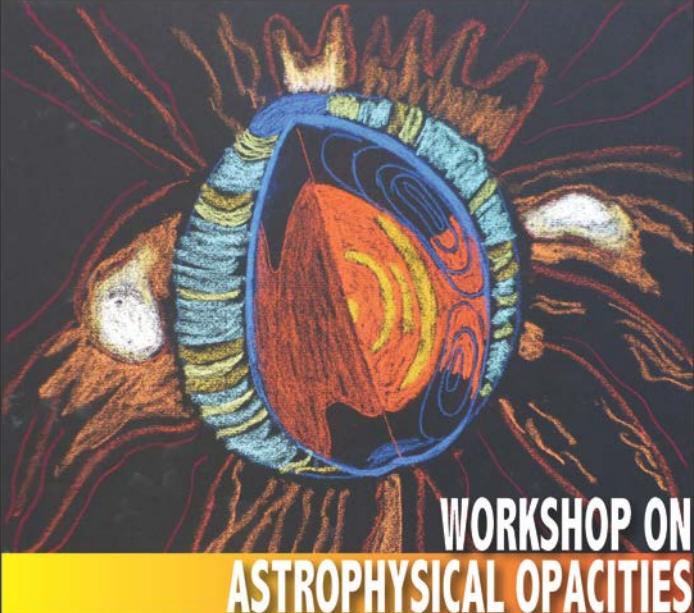
**BS Physics,
Western Michigan University
PhD Physics,
Harvard University**



David did a double major in Physics and Chemistry at WMU, graduating summa cum laude in 2004. He went on to earn his Ph.D. in Physics from Harvard University, where he began studying surface chemistry and the stochastic dynamics of ions in nanopores. As a graduate student he was recognized with multiple teaching awards. After completing his doctorate in 2010, he remained at Harvard as a postdoctoral researcher, turning his attention to nanopore-based studies of the dynamics of DNA molecules. From there he took a joint Research Associateship between the National Institute of Standards and Technology (NIST) and the National Institutes of Health, where he combined physics, chemistry, and biology in truly multi-disciplinary studies of proteins and cell membranes, with applications to new generations of cancer- and neurodegeneration-fighting drugs. He continues this work as a research physicist at NIST, with a focus on neutron reflectometry of membrane proteins.



The Department of Physics held the Workshop on Astrophysical Opacities (WAO) on August 1–4, 2017 at the Fetzer Center here on campus. The workshop’s purpose was to gather opacity data producers and consumers from both the atomic and molecular sectors in order to contribute to solving outstanding problems and to develop more effective and integrated interfaces. On August 2, 2017, Western Michigan University held the Forum on “Gender equality in science and technology: a new paradigm?” at the Ladies’ Library Association. This forum sought to explore recent accomplishments in Europe compared to those in the USA.



Natalya Crichley: The solar interior

WORKSHOP ON ASTROPHYSICAL OPACITIES

1-4 AUGUST 2017
WESTERN MICHIGAN UNIVERSITY
KALAMAZOO, MI, USA

Invited Speakers

Georges Alecian (Obs. Paris, France)
France Allard (ENS-Lyon, France)
Sarbani Basu (Yale U, USA)
Peter Bernath (Old Dominion U, USA)
Nuria Calvet (U Michigan, USA)
Arnaud Colaitis (CNRS/CEA/LLNL)
Franck Delahaye (Obs. Paris, France)
Doron Gazit (RIP/HUJ, Israel)
Iouli Gordon (CfA, USA)
Stephanie Hansen (SNL, USA)
Xinchuan Huang (NASA, USA)
Ivan Hubeny (U Arizona, USA)
Shashi M. Kanbur (SUNY, USA)
Robert L. Kurucz (CfA, USA)
David P. Kilcrease (LANL, USA)
Caroline Morley (CfA, USA)
Taisuke Nagayama (SNL, USA)

Sultana N. Nahar (OSU, USA)
Jean-Christophe Pain (CEA, France)
Ted S. Perry (NIF/LANL, USA)
Anil K. Pradhan (OSU, USA)

Scientific Organizing Committee

Jim Bailey (SNL, USA)
Manuel Bautista (WMU, USA)
James Colgan (LANL, USA)
Carlos Iglesias (LLNL, USA)
Claudio Mendoza (WMU, USA)
Jonathan Tennyson (UCL, UK)
SylvaineTurck-Chièze (CEA, France)
Claude Zeppen (Obs. Paris, France)


Local Organizing Committee

Manuel Bautista (WMU, USA)
Tom Gorczyca (WMU, USA)
Kirk Korista (Chair, WMU, USA)
Claudio Mendoza (WMU, USA)

W
WESTERN MICHIGAN UNIVERSITY
Physics

Discover | KALAMAZOO

<http://eventos.redclara.net/e/wao>



Natalya Crichley: Ladies' Library

FORUM ON GENDER EQUALITY IN SCIENCE AND TECHNOLOGY: A NEW PARADIGM?

Wed, 2 August 2017, 6 p.m.
Ladies' Library Association
333 S. Park Street, Kalamazoo

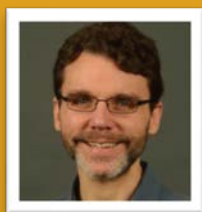
Invited Speakers

Sylvaine Turck-Chièze (President, Association Femmes & Sciences, France)
Jennifer Lentner (Senior Director, Marketing Communications, Stryker)
Carla M. Koretsky (Dean of the College of Arts and Sciences, WMU)

W
WESTERN MICHIGAN UNIVERSITY
College of Arts and Sciences

Discover | KALAMAZOO

<http://eventos.redclara.net/indico/event/747/page/2>



Effective July 1, 2017, Dr. Charles Henderson became the Director of the Mallinson Institute for Science Education.

A WMU faculty member since 2002, Henderson not only teaches, but also co-founded and co-directs the WMU Center for Research on Instructional Change in Postsecondary Education. His research, which has been supported by more than \$7 million in external grants, focuses on understanding and promoting instructional change in higher education.

Henderson is a Fulbright Scholar and Fellow of the American Physical Society as well as the senior editor for Physical Review Physics Education Research and has served on National Academy of Sciences committees dealing with undergraduate education in physics and STEM areas.

Dr. Kayani and Dr. Tanis were interviewed by WMUK about the department's particle accelerator. The article explores the history of the accelerator, and touches upon some of the ways the accelerator can be used to conduct experiments. You can visit [WMUK's website](#) to read the entire article.



Nuwan Kumara, graduate student, and Dr. John Tanis recently had their first paper published on the radiative double-electron capture (RDEC) experiment they are currently conducting.

David LaMantia was invited to give an oral presentation of his poster on the same work stated above at the ICPEAC (International Conference on Photonic, Electronic and Atomic collisions) conference that he attended in July. Madhushani Wickramaratna also presented her poster titled Double Photoionization of Atomic Oxygen: Feshbach Resonances in the Two-Electron Continuum at the conference. Dr. Tanis also attended the conference which was held in Australia.

Dr. Tanis had his NSF (National Science Foundation) grant renewed for another three years. The grant is funded at the level of \$120,000. This will enable the continuation of his experimental work on the radiative double-electron capture (RDEC) project.

Dr. Famiano and Dr. Chajeki have been awarded an NSF grant worth \$420,000 to study how heavy elements were formed and provides further constraints on the characteristics of dense nuclear matter.

Dr. Litvinova has been awarded an NSF CAREER grant worth \$474,998. The project will address important issues of the nuclear structure theory. A novel theoretical approach aims at establishing the link between fundamental interactions of matter constituents and emergent collective phenomena in complex nuclear systems. The project will also include innovative outreach activities at the interface of science and visual arts.



The department gathered on May 3, 2017 for a farewell dinner to celebrate the career of Dr. Emanuel Kamber. Emanuel began his career at Western Michigan University in 1989 and has served our department as a professor of atomic and molecular physics for 28 years.

While at WMU, he conducted research in atomic and molecular physics and continued his research collaboration with his colleagues at Swansea and Kansas State University. He supervised five M.A. theses and two Ph.D. dissertations, authored 80 refereed articles published in research physics journals, presented over 100 papers at national and international conferences, and authored two chapters in two books.

His future plans include volunteering, spending time with his family, and traveling the world to sightsee and visit relatives. Our department wishes him well as he embarks on this next adventure.



Department of Physics
1903 W Michigan Ave
Kalamazoo MI 49008-5252

WESTERN MICHIGAN
UNIVERSITY

I wish to contribute to the further success of Western Michigan University's Department of Physics. Your gift is important to our campus community and will benefit new opportunities to enhance the department's teaching or research efforts or will assist students in achieving their educational and professional goals.

Your contribution will be processed through our WMU Foundation, and forwarded to the designated department.

Yes, I want to support the WMU Department of Physics!

In a time when state funding is increasingly restricted, the support we receive from friends and alumni is vitally important. Thank you for considering a gift to the WMU Department of Physics.

The WMU Foundation processes all gifts that come to the University and forwards 100 percent to the department.

Please accept my gift in the amount of: \$ _____

Check payable to WMU Foundation

(please designate Department of Physics on memo line)

Credit card (check one) ☐ MasterCard ☐ Visa

Account #: _____

Expiration date: _____

Three-digit code: _____

Signature (required): _____

Electronic Funds Transfer *(instructions will follow)*

You can also give online at:
www.wmich.edu/physics/giving

Please mail the completed form, along with your gift, to:
Western Michigan University
WMU Foundation Office
1903 W. Michigan Avenue
Kalamazoo, MI 49008-5403